

REMARKS

In the Office Action, the Examiner withdrew the allowability of claims 1-18, 20, 21, and 27-57 in view of newly discovered references. In addition, the Examiner rejected claims 1-18, 20, 21 and 27-57 under 35 USC §103(a). These rejections are fully traversed below.

Claims 1-18, 20, 21, and 27-57 remain pending in the application. Reconsideration of the application is respectfully requested based on the following remarks.

PATENTABILITY OF CLAIMS 1-18, 20, 21 AND 27-57

In the Office Action, the Examiner rejected claims 1-10, 12, 15 and 16 under 35 USC §103(a) as being unpatentable over Bolken et al. (US Patent Publication 2004/0229401 A1) in view of Cole et al. (US Patent 6,705,925 B1); rejected claims 11, 13 and 14 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and further in view of Bolken (US Patent 6,444,501 B1); rejected claims 17, 21 and 55 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and Featherby et al. (US Patent 6,368,899 B1); rejected claims 18 and 56 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and Cho (US Patent 6,235,555 B1); rejected claim 20 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and further in view of Joshi et al. (US Patent Publication 2004/0018667 A1); rejected claims 27, 29-31, 33-40, 42-47, 49-51 and 53 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and Bayan et al. (US Patent 6,399,415 B1); rejected claims 28 and 32 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and Bayan et al. and further in view of Kim et al. (US Patent 6,489,218 B1); rejected claims 41 and 54 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and Bayan et al. and further in view of Cho; rejected claim 48 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and Bayan et al. and further in view of Islam et al. (US Patent Publication 2004/0058478 A1); and rejected claim 52 under 35 USC §103(a) as being unpatentable over Bolken et al. in view of Cole et al. and Bayan et al. and further in view of Bolken. These rejections are fully traversed below.

Each of the rejections utilized by the Examiner makes use of Bolken et al. together with Cole et al., and in many cases one or more additional secondary references. Nevertheless, our

discussion below focuses on Bolken et al. and Cole et al. as the reliance on these references is shown to be insufficient to support the rejections under 35 USC §103(a).

Bolken et al. describes a method for fabricating a semiconductor component that includes a substrate and multiple stacked, encapsulated semiconductor dice on the substrate. Cole et al. describes a method and apparatus to dice integrated circuits from a wafer using a pressurized jet. Claim 1 pertains to a method for concurrently forming a plurality of integrated circuit products. The method involves providing a multi-instance leadframe or substrate having a plurality of instances. Then, one or more dies (dice) are attached to each of the instances on at least one side of the multi-instance leadframe or substrate. The one or more dies are then electrically connected to the respective instance of the leadframe or substrate. Thereafter, the plurality of instances on the at least one side of the multi-instance leadframe or substrate can be encapsulated together using a molding compound. Next, each of the plurality of instances is singulated using at least non-linear shaping of at least one region of each of the plurality of instances, thereby forming the integrated circuit products. The non-linear shaping of each of the instances by the singulating is achieved through curvilinear or non-rectangular cutting during singulation.

Bolken et al., at paragraph 52, describes that multiple components 10 can be formed on a substrate 12 and then singulated into separate components 10. However, nothing in Bolken et al. teaches or suggests that the singulating of the multiple components is anything but conventional linear singulation. FIGs. 2F and 3F as well as paragraph 67 of Bolken et al. refer to singulating and indicates that the singulating step “can be performed using techniques that are known in the art such as sawing, shearing or punching.” In particular, FIG. 2F shows only a linear shaping and paragraph 67 does not indicate any other type of shaping. Hence, Bolken et al. fails to teach or suggest singulating using at least non-linear shaping.

On page 3 of the Office Action, the Examiner does admit that Bolken et al. fails to teach “the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said singulating.” However, to compensate for this deficiency of Bolken et al., the Examiner relies on Cole et al. Namely, the Examiner points to FIG. 2 of Cole et al. However, FIG. 2 of Cole et al. is concerned with a wafer 200 that is segmented. The wafer 200 has a plurality of dice 202 on the segmented wafer 200. The segmented wafer has cuts 204, 206 and 208 which are described as parallel or perpendicular cuts to one another. In any case, the cuts 204, 206 and 208 are linear cuts. Still further, the cuts are with respect to a semiconductor wafer of dice 202. In contrast, the singulating performed in claim 1 is singulation of integrated circuit products that are formed on a leadframe or substrate

and which include one or more dies and are appropriately encapsulated. While Cole et al., does teach that an irregularly shaped die can be cut from a wafer, claim 1 is not concerned with cutting of individual dies. Instead, claim 1 is concerned with singulation of encapsulated integrated circuit products that include one or more dies formed on a substrate or leadframe.

Furthermore, there is no motivation of record that would cause one skilled in the art to combine Cole et al. with Bolken et al. Bolken et al. has no need for the die singulation approach of Cole et al. Bolken et al. indicates in paragraph 67 that its singulation is performed using known techniques, such as sawing, shearing or punching. These techniques are appropriate for the needs in Bolken et al. Hence, there is no motivation for one of ordinary skill in the art to look to Cole et al. Still further, the various dies 14, 16 utilized in FIGs. 2A-2F of Bolken et al. are already singulated when applied to the substrate 12. Hence, there is no motivation for using any die singulation techniques of Bolken et al. or Cole et al. to singulate integrated circuit packages as recited in claim 1.

Based on the foregoing, it is submitted that claim 1 is patentably distinct from Bolken et al. alone or in combination with Cole et al. The other independent claims 17, 18 and 21 also pertain to a method for concurrently forming a plurality of integrated circuit products in a generally similar manner. Hence, it is submitted that claims 17, 18 and 21 are also patentably distinct from Bolken et al. alone or in combination with Cole et al. Furthermore, claims 27 and 42 pertain to a method for concurrently forming a plurality of memory cards. The methods recited in claims 27 and 42 also make use of singulation using non-linear shaping. Accordingly, for similar reasons to those noted above with respect to claim 1, it is submitted that claims 27 and 42 are also patentably distinct from Bolken et al. alone or in combination with Cole et al. None of the additional secondary references are able to overcome the deficiency of Bolken et al. and Cole et al. The additional limitations recited in the independent claims or the dependent claims are not further discussed as the above-discussed limitations are clearly sufficient to distinguish the claimed invention from the cited references. Thus, it is respectfully requested that the Examiner withdraw the rejection of claims 1-18, 20, 21 and 27-57 under 35 USC §103(a).

SUMMARY

It is submitted that claims 1-18, 20, 21 and 27-57 are patentably distinct from the cited references. Reconsideration of the application and an early Notice of Allowance are earnestly solicited.

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-0388 (Order No. SDK1P014).

Respectfully submitted,
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